

EPIDEMIC OF MEASLES
IN
SUNDERLAND

DRINKWATER

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REMARKS

UPON THE



EPIDEMIC OF MEASLES

PREVALENT IN

SUNDERLAND,

WITH NOTES UPON 311 CASES FROM MIDDLE OF
JANUARY TO END OF MARCH 1885.

BY

HARRY DRINKWATER, M.D., C.M., M.R.C.S.L., &c.,
SUNDERLAND.

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DR DRINKWATER'S THESIS
FOR THE DEGREE OF
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ON AUGUST 1ST, 1885.



P R E F A C E.

THE following paper, which gives the results of my observations of 311 cases of measles, occurring in a single epidemic, has been written in the intervals of an exceedingly busy practice. The cases treated of have occurred from the middle of January of this year, up to the end of March, since which time I have not recorded any in the list, in order that each case might be complete. The recording of these cases has involved an immense amount of labour *crowded into a short time*. There is only one thing I have to regret in reference to them, viz., that it has been simply *impossible* to take systematic observations of temperature, so that I am unable, from what I have myself seen, to say much in relation to it, beyond the fact that in *normal* cases there is a great fall between the first and third days of the prodromal stage, and that the highest temperature usually occurs on the evening of the second day of the rash, after which it declines rapidly, becoming normal on the fourth, or perhaps not until the sixth day. Another fact is worth

recording, viz., that a fall to the normal (98·6) on the morning is not nearly so favourable an indication as the same temperature in the evening, for it seldom rises again after this evening fall, but often does after a normal morning temperature. At the end I append three of the most complete charts.

H. D.

SUNDERLAND, *April* 27, 1885.

ERRATA.

Page 46, line 6 from foot, *for* "p. 31," *read* "27."

Page 47, line 16 from top, *for* "p. 41," *read* "33."

*Remarks upon the Epidemic of Measles
prevalent in Sunderland.*

DURING the past four months Sunderland has been visited by an epidemic of measles, of so virulent a type and so great a magnitude as to numbers affected, that it has from the first appeared to me deserving of a more careful study than is usually made of it. Its onset was more sudden than is usually the case, and it very rapidly increased in extent, until the first week in February, by which time little room was left for other exanthemata. During the seven and a half years of my experience as a "general practitioner," no other epidemic has spread in this borough so rapidly, though it has been visited during that time by scarlatina, measles, small-pox, typhus, and pertussis. It is stated (Aitken's "Science and Practice of Medicine," Vol. I., pp. 500-1) that an epidemic of measles, beginning in the winter, usually reaches its maximum about the vernal equinox, and this epidemic has not been an exception to that rule, the number of deaths having increased each week until the 21st March, when the highest number was registered, viz., fifty, and after which there was a very rapid decrease, at about twice the rate of the previous increase (see table furnished by Medical Officer of Health, appended). The part of the town where the disease has been the most prevalent is Bishopwearmouth North (including the parishes of Pallion, Millfield, Deptford, and Ayres Quay, and part of Bridge Ward), and, as might be ex-

pected, the great majority of the deaths have occurred there. Moreover, the disease has there assumed a worse type than in other districts, and the cause is not difficult to ascertain. This does not lie in any specially defective sanitary arrangements, but in the great poverty of those residing therein. There is abundant distress in *all* parts of the town, but the Bishopwearmouth North district has suffered more than the others, because of the almost total stagnation of all branches of the shipbuilding and bottle-making trades, which usually give employment, directly or indirectly, to most of the workmen residing in the district. In consequence of this, a large proportion of the people, and all the improvident ones, have been suffering from semi-starvation.

The relief afforded by the soup kitchens, where bread, soup, &c., have been distributed three days a week, has only been sufficient to keep the healthy ones alive, whereas a much larger proportion than usual of the sick have succumbed. Before the onset of the measles, the health of many had suffered to such an extent, that marked prostration set in early, independently of any complication; and probably a fatal result would less frequently have occurred, had the children been well nourished previously. Many of those who have recovered have had a long, tedious convalescence, and this has been especially noticeable amongst the very poorest people.

Those cases occurring in the "well-to-do" parts of the town have been of the usual type, and comparatively few deaths have occurred amongst them. The population of Bishopwearmouth North is stated by the Medical Officer of Health to be 38,783, and that of the whole borough 125,273, so that the number of deaths has been twice what it ought to have been in proportion to the population. To convey some idea of the extent of the

distress existing in Sunderland at the present time, I may say that the number of persons in receipt of relief lately has been as many as 12,520 in one week, in addition to all the out-door relief dispensed by the Board of Guardians.

I give an extract from the *Sunderland Daily Echo* of March 30th, in which reference is made to this.

“When the work of the Relief Committee seems to be all but completed, I may fitly give a brief retrospect, showing the extent of the operations. From April 16th, 1884, to the end of July, £776 odd were expended, or something like £51 per week. The second period commenced in September, and up to the 21st inst., £9138, 9s. 7d. were expended, at a rate which averages over £365 per week. Up to March 21st, therefore, I may safely put the expenditure at over £10,000, every penny of which has been received in voluntary subscriptions, in addition to the very large quantities of vegetables and other provisions and clothing. The average number of families upon the fund during the second period was over 3400, the largest number in one week was 3957, and the largest number of individuals was 12,520. Last week there were still 2897 families upon the lists, and 9830 individuals. When the accounts due are paid, the General Committee will to-night have more than £150 at their disposal, if they have so much. During the existence of the relief operations, workmen on strike must have received at the very least between £20,000 and £30,000 from their unions, so I may without exaggeration say, that within the last two years not less than £50,000 must have been expended in money and goods to relieve workmen not in employment and their families, in addition to the large sums administered weekly by the Poor Law Guardians, in the shape of test

labour, and in the ordinary way. I could make these figures the text for a good many homilies, but my voice would be as the voice of one crying in the wilderness: it would do no good, so for once I will leave my readers to draw their own conclusions."

The Medical Officer of Health for the borough has drawn my attention to the fact that the number of deaths occurring recently from diseases of the respiratory system is in excess of that for the corresponding period of last year, and suggests that this is due to undiscovered cases of measles. There is probably some truth in this, but I can scarcely believe that the entire excess is due to this cause alone, for, if such were the case, then the number for each week would bear something like a proportion to the number of deaths due to undoubted measles, and this has not been found to be true. I am of opinion that children have often succumbed to *simple* inflammatory attacks of the respiratory mucous membrane, in consequence of the impoverished condition of their bodies, just as they have succumbed to what, under more favourable circumstances, would have been measles of an ordinary mild type. Still, I have no doubt that many of the deaths certified as being due to disease of the respiratory organs have, as the Medical Officer suspects, arisen from measles, either directly or indirectly. I may divide these into two classes, the *first* including those (*a*) such as No. 77 in my list, which child had been ill seven days before I was called in to attend it, and the rash was discovered by myself, the mother not having noticed it, owing to its being confined to the back, where, however, it was sufficiently abundant and well marked. The child was nearly dead when I saw it, and it only lived about thirty hours afterwards. Had it died the day before my first visit, which might easily

have occurred, the cause of death would have been returned as due to "pneumonia;" or (b) such as No. 163, about which there could scarcely be any doubt, seeing that it began exactly with another child of the same family, and presented all the characteristic symptoms of the prodromal stage of measles, but proved fatal before the rash developed. Had this child suffered *alone*, its death would have been attributed to "pneumonia."

The *second* class of cases includes those deaths arising a few weeks after convalescence from measles, from respiratory diseases such as pneumonia and croup especially, to which the child seems very liable for a month or two afterwards, the recent attack of measles acting as the predisposing cause, though in many cases probably it has not been mentioned as such on the death certificate.

In the present paper I do not mean to give an exhaustive account of measles in general, but merely to refer to those points which have appeared to me to be particularly deserving of remark, and have not, to my knowledge, been specially dealt with by authors on the subject.

The information respecting the first or prodromal stage having in some cases been obtained from the parents, I cannot of course vouch for its being absolutely correct, but as to the remaining details, I lay claim to the strictest accuracy. I have made careful inquiry respecting those children who are alleged to have had an attack of measles previously, and am bound to acknowledge that second attacks do occasionally occur. One case has occurred under my own observation, in which the true measles rash—without the catarrhal symptoms, however—recurred, with the characteristic miliary papules, a month after the primary attack (see

No. 37). Still I am of opinion that a second attack of measles is even more rare than a second attack of scarlatina, *i.e.*, that one attack of measles confers more immunity upon the individual than does one of scarlatina. Of the 188 children who are alleged to have had measles previously, twelve have taken it again, or a percentage of 6.4. Of these twelve, nine were in three families, which seems to indicate *family* rather than *individual* susceptibility; in other instances, there seems a family *insusceptibility*, a greater number escaping than contracting the disease.

It is perhaps worth recording that only two of the above twelve children had been under medical attendance on the former occasion.

Measles appears to be about the most infectious of the exanthemata. In the families where my cases occurred, there were 364 children who had not previously *had* the disease, of which number thirteen were infants under one year, who have little susceptibility to it: if we deduct these, we then have 351 who might contract the disease during the present epidemic, and 308 have done so, so that only forty-three have escaped.

There is no doubt, whatever, that measles is infectious during the first or prodromal stage, and that in this stage it is usually propagated, though, in order to prove it *directly*, one would have either to transplant some contagion-bearing substance from a child in the first stage of the disease, or show that where the disease has occurred there had not been the possibility of infection at a later stage, and this I have not done. In Mayr's experiments (quoted in Ziemss. Encyclop., p. 40, Ac. Inf. Diseases), he does not say to what stage of the disease the case from which he took the nasal mucus had advanced. But it may be clearly shown, *indirectly*,

that contagion is produced before the rash appears. In the *first* place, cases Nos. 81 and 284 show that fourteen days, *at the least*, elapse from the entrance of the poison to the appearance of the exanthem ; also the child No. 229 played with No. 228 before the rash appeared in the latter, who lives below the former in a tenemented house, and I could discover no other likely means of infection. *Secondly*, the first stage of manifestation of the disease is of four days' duration ; this gives ten days as the period of the incubative stage. *Thirdly*, if we reckon back fourteen days from the appearance of the rash in the second case or cases in a family, this brings us *most frequently* to an early day of the prodromal stage of the one first affected, at which time we must suppose the disease to have been contracted. *Fourthly*, the rapid spread of this epidemic can scarcely be accounted for except by supposing the public day schools to be instrumental in disseminating the contagion. Many children in my list were attending school until within a few hours of the appearance of the rash, and were sent home because of the cough, the teacher in some cases believing it to be "croup." And this is not to be wondered at, seeing that such an amount of pressure has been put upon parents to send their children to school, in order to be prepared for the recent Government examination. Indeed, I have known of several cases where some children of a family were attending school during the time a brother or sister was suffering from the measles. I can find nothing insuperable in closing the schools during such an extensive epidemic, and holding the examination later on ; and I think the teachers should have the Government grant for all those children who have been kept away *by an infectious disease* (after having attended a good part of the year previously),

whether they pass the examination or not. "Payment by results" has its *disadvantages*, especially to the scholars. From the above considerations, it is manifest that in nearly all cases the disease is spread during its first or prodromal stage. The disease is also spread to some extent by the neighbours, who pay frequent and often prolonged visits to one another's houses, especially when the children are ill; when the illness is caused by a contagious or infectious disease, and the neighbours are remonstrated with, they simply retort that *they* are "not afraid of getting the disease," and one often tries in vain to convince them that they act as transmitting media, and carry the contagion to their children. Moreover, a mother, when making one of these visits of commiseration, will sometimes carry her youngest child in her arms (as I have seen); this child takes the measles, and afterwards infects the rest of the family. Of the forty-nine families in which three or more have (recently) been affected with measles, the oldest child, or two eldest children, viz., those attending school, have been the *first* to suffer in twenty-seven cases; the youngest has been first in nine cases, and an intermediate one in thirteen, which seems to show that schools are the most potent means of spreading the disease. It may also have been spread in a few instances by their teachers and scholars, who have been sent to houses to inquire about the absent ones.

Does the medical attendant ever carry the measles from one house to another? Does he ever convey "puerperal fever"? The last, I fear, must be answered in the affirmative, and probably the first also. I think, however, that this mode of transmission is rare, and would be still less frequent if the "Doctor" would endeavour to carry away from the infected person as few "germs" as possible, by not handling the patient more

than necessary, and taking care to remain standing whilst in the sick room, and, after leaving it, endeavour to get the "germs" blown away before entering another house. I have seen an "experienced" medical man sit down upon the bed in which a child, suffering from scarlatina, was lying. Surely his clothes would contain a considerable amount of contagion.

Though measles is generally said to be a disease of childhood, yet perhaps people of all ages are susceptible to it who have not previously been attacked, with the exception of those under six months old, who as a rule escape. Of thirteen children under six months old in the families named in my list, only three contracted the disease (viz., Nos. 100, 231, and 247), and in each case it was mild, so that no death occurred amongst them, which, as will subsequently appear, is a very different result to what occurs within the next six months.

The reason for the comparative immunity of children under six months is difficult to ascertain.

The stage or period of incubation is of ten days' duration. Case No. 81 shows that it is not *less* than this. This child, the only one of the family, was taken by its parents from Sunderland to a small town thirty miles distant, where at the time there were no cases of measles. The eruption appeared on the fourteenth day after, so that it probably contracted the disease the very day on which he left home. Then again, Nos. 284 and 285 occurred (*i.e.*, the exanthem was manifested) on the fourteenth day after the grandmother went to stay at the house. She, no doubt, carried the contagion to them from the children of another daughter, who were suffering from it. Seeing that the first stage of manifestation of the disease lasts four days, we have ten days during which the disease lies latent, though it is not at all rare

to observe some cough a few days before the proper time for the prodromal stage to commence. The number in the column headed "interval in days" has reference to the number of days that elapsed from the first appearance of the rash in the child *first* attacked, to the first appearance of it in the others of the same family. Now, these figures show clearly that in almost every instance the disease was contracted during the prodromal stage. Where the interval is ten days I infer that the measles was contracted on the *first* day of the first stage (and here I may state that by *first stage* is always meant in this paper the first manifestation, or the prodromal) ; where eleven days, that it was contracted on the second day ; where twelve, on the third day ; where thirteen, on the fourth day, *i.e.*, the *last* ; and where fourteen, on the first day of the eruptive or second stage. Where there is a day or so difference between the intervals in the second ones, I think this is due, not to any delay in the appearance of the rash in the last child, but to some difference in the time at which the contagion has entered the bodies of the children, and for this reason, that in a large number of cases, the rash has appeared quite simultaneously in two or more.

The following table shows the intervals in my cases :—

Interval in days,	8	9	10	11	12	13	14	15
Number of cases,	0	1	22	34	14	21	11	1

The above table seems to show that the contagious principle is developed suddenly on the first day of the prodromal stage, and also that more active contagion exists upon the first and second days than upon the

third, and perhaps the latter fact ought not to surprise us, seeing that the temperature and general condition are more disturbed on the former days than on the latter. Where the interval has been less than ten days, the source of infection has not been one of the same family (viz., the first attacked), but a source similar to the one from which the first got the disease, viz., a school-fellow or neighbour. These numbers clearly show that the duration of the first stage is four days, and though the cough may have begun previously, I have never seen other catarrhal symptoms or a rise of temperature last longer than four full days prior to the outbreak of the exanthem.

THE FIRST STAGE OF MANIFESTATION OF THE DISEASE,

therefore, is that which begins four days before the rash appears. This has been less observed than the subsequent stages of eruption (2d) and of convalescence (3d), and information concerning it is consequently not so definite. Judging from the statements of parents, it *appears to be* occasionally shortened or lengthened. One can easily understand why they sometimes assign one or two days as its duration in certain cases, seeing that the child is frequently worse on the fourth day before the rash appears than during the two subsequent days, when it may be running about apparently quite well (even with a temperature of 102°), and not take to its bed until the last day of this stage, under which circumstances the parent will say that it was only one day ill before the rash came out. Probably this stage is never absent. Cough, as a rule, is the

first symptom, and it is quite characteristic. It is a muffled bark, partaking of the character of both croup and whooping cough, being very like the former in *sound*, and the latter in its spasmodic nature, often occurring at intervals of an hour more or less during the night, and lasting from a minute to a quarter of an hour each time. It remains dry for three or four days, or even longer, during which time no wheezing can be heard in mild cases. *Vomiting* usually occurs by the third day, sometimes earlier. It does not generally, except in very severe cases, continue into the second stage. It is somewhat cerebral in character, and may or may not be accompanied by nausea. *Convulsions* are not so frequent or so violent as at the onset of scarlatina, and never, in my experience, do they prove fatal in this stage. But a semi-comatose condition is by no means rare, even for three days, disappearing immediately on the supervention of the eruption. *Enlargement of lymphatic glands*, below the angle of the jaw, may often be felt, but rarely seen. My observations are in perfect accord with the statement of Thomas of Leipzig, that "the lymphatic glands appear frequently to become somewhat enlarged, even before the exanthem." (Ziems. Encylop., art. Measles, p. 74.) The *throat* shares in the catarrhal affection, and, as a rule, shows a punctate dusky congestion a full day before the second stage begins. Occasionally I have observed a *general* congestion of the *skin* on the day preceding the proper eruption. In case 119 it was as bright as in scarlatina.

Lastly, *complications* may, before this stage is completed, have assumed a serious character, and even prove fatal before the rash is fully out.

THE SECOND OR ERUPTIVE STAGE

probably commences at a definite time from the entrance of the poison. We are warranted in this opinion by the fact that two, three, or more eases will commence simultaneously, although one or more may have exhibited catarrhal symptoms a day or two previously to the others. Such was the case in Mayr's experiments. (*Ibid.* p. 40.)

The site of the first appearance of the exanthem is assigned by all authors, so far as I am aware, to the face, especially the temples and forehead, near the roots of the hair. Thomas, after saying that the spots *first* appear on some part of the face, adds, "somewhat later, but still at an early period, they also often appear upon the throat, neck, and upper parts of the breast and back; only very rarely, and then faintly, do they appear upon the last named or other parts first." (*Ibid.* p. 66.) I must take some exception to this statement, for although it is no doubt true that the rash, in the majority of eases, is *first seen* on the face, yet I am of opinion that it first develops upon the *back*, as often as upon the face, though, of course, it is more likely to be unobserved. Indeed, I am inclined to think that it most frequently comes out first on the back, for I have only seen the rash in *one* case on the face alone (in addition to two others in whom it never spread beyond it), whereas I have seen it seven or eight times well out on the back before there was the slightest appearance of it on the face or any other part of the body. The explanation probably lies in the fact that this part is kept warmer than the face and the rest of the body generally, when the child is lying in bed, and thus encourages the

capillary congestion. One case seemed clearly to show the effect of warmth, for on the third day of the rash, when it was beginning to fade and had quite disappeared from the face, after the child had been lying in its cradle a short time on its left side, the rash reappeared on the left (lowest) side of the face as distinctly as ever, but not at all on the right side. Below I give the site of its first appearance in the 291 cases where it has been recorded :—

Face first in	.	.	.	171 cases.
Back	.	.	.	38 „
General	.	.	.	35 „
Trunk	.	.	.	10 „
Face and Back	.	.	.	7 „
Neck	.	.	.	7 „
Abdomen	.	.	.	3 „
Breast	.	.	.	3 „
Legs and Feet	.	.	.	3 „
Arms	.	.	.	2 „
Neck and Breast	.	.	.	2 „
Face and Neck	.	.	.	2 „
Arms and Trunk	.	.	.	1 „
Chin and Legs	.	.	.	1 „
				—
Total	.	.	.	285 „

In the following cases the eruption was partial, *i.e.*, never spread beyond the parts named :—

Face only in	.	2 cases (viz., Nos. 94 and 148.)
Face and Forearms	.	1 case (No. 298).
Face and Back	.	2 cases (Nos. 68, 238.)
Arms and Legs	.	1 case (No. 222).
		—
Total	.	6

In the cases where the rash is said to be "general," it was discovered in the morning, by which time it had invaded the whole integumentary surface more or less. Of the six cases in whom the rash was partial, two died, two were severe and two mild cases.

The *colour of the exanthem* has, in nearly half of these cases, been exceptionally dark, often, indeed, darker than I have ever noticed it in previous years, and has perhaps been most strongly marked where the throat has been most affected.

The *usual duration* is from three to five days, but it may last ten, and even then recur after fading, or may continue visible for a few *hours* only (cases 18 and 165).

As to a *sudden retrocession* of the rash, I do not think there is any truth in the popular belief that it is a *source* of danger, but rather, that it is itself the result of some complication such as occurred in No. 76 and others, for the complication appears generally to have commenced before the rash disappears in these cases, and consequently is more an *indication* than a source of danger. It no doubt points to deficiency of tone in the system, and a fatal result often ensues.

Recurrence of the rash occurred in case 59. At first it was visible for one day only, then, after being absent ten days (during which time the child was well and running about), it returned as distinctly as before, and continued out the usual time—three full days. It would almost appear as though this boy in the *first* instance had only got a partial dose of the contagion, one insufficient to develop *fully* the "physiological action," and had afterwards got a second and larger dose from his brother, the rash in this instance appearing after an interval of thirteen days from its appearance in the first child.

Morbilli sine exanthemate occurs as surely as does scarlatina without rash, and is usually seen in adults, only one of my four cases having been in a child. Those adults affected could not say whether they had had the measles in childhood. In all, the symptoms were well marked, there being marked catarrh of the nasal and laryngeal mucous membrane, slight rigors, a temperature of about 103.5° . The cough was frequent, and remained dry for three or four days, after which there was a *slight* secretion of mucus, but no wheezing or other signs of pulmonary or bronchial inflammation could be detected by stethoscopic examination. Moreover, these all occurred along with other cases of fully developed measles in the family. There was marked prostration in all, and the average duration was about ten days. The conjunctivæ and eyelids were greatly congested and swollen in one case, desquamation occurred over the chest in another, which would seem to point to some previous eruption, though none was noticed.

Morbilli sine catarrho may appropriately be mentioned here. I have had two well-marked cases of this "variety" of measles, both young ladies, one aged nineteen, the other twenty-eight. Each had previously had measles. There was not the slightest sign of catarrh of the respiratory mucous membrane, but there was an elevation of temperature of about 4° . The exanthem lasted three days, and was well marked. These cases have occurred since my list was completed, and are therefore not included in it.

Desquamation appears quite indefinitely. It appears to have been little studied. I have observed, first, that it is sometimes absent, or at any rate imperceptible; secondly, it may not begin until about seven days after the rash has faded, but, as a rule, it may be detected before the

eruption has quite disappeared; thirdly, it does not seem to bear any relation to the colour or amount of the rash; fourthly, it is most abundant on the *face*, and may here be tolerably profuse, as early as the third day of the second stage; lastly, however profuse or scanty, it is always in the form of *fine* scales.

The *tongue* remains furred longer than it does in scarlatina, and seldom assumes the red irritated appearance over the whole surface constituting the “strawberry tongue” of the latter; the region of elevated papillæ being confined generally to the anterior half, tending to spread backwards along the central line and edges, leaving the intermediate spaces covered with a coating of fur, thus:—



Its colour also is dusky purple, like that of the skin spots, and may assume a very dark cyanotic appearance. *Ulcers* are by no means uncommon in children of low vitality; they are generally either small and arranged along the edge of the organ,

or large and on the dorsum. In the latter situation they are more or less transverse, and remind one of the “callous ulcers” of the lower extremities, having a similar raised white edge. They are quite superficial, and differ widely in this respect from the deep transverse cracks so common on the dry tongue of the typhoidal cases. The following diagram will serve as an illustration. It is an actual representation of one of the cases.



The *throat* always, so far as my observations go, shows more or less of dusky congestion. As a rule, it is not involved further than this, the congestion extending over the fauces and upper part of the pharynx, but being most

strongly marked over the velum pendulum palati. But in addition to this, there is in not a few cases considerable swelling of the tonsils, and this was present in all the cases marked "sore" in the throat column. Sometimes the tonsils meet in the middle line, *but I have never in a single case observed the slightest ulceration*, such as occurs so markedly in even mild cases of scarlatina, though now and then there is, at first sight, an *appearance* of ulceration produced by the adhesion of a little tenacious mucus. I agree with Thomas when he says "angina morbillosa is by no means rare." (*Ibid.* p. 96.) *Vomiting* is rare after the first few hours from the commencement of this stage. *Diarrhœa*, if slight, is beneficial, or at any rate not injurious, and needs no treatment. It is very apt to result from injudicious treatment of the constipation, which is a more common and more serious condition. The *Urine* is much diminished in quantity, hence we get a considerable deposit of urates in almost every case. But these deposits are more abundant than is to be accounted for solely by the state of concentration of the urine, sometimes amounting to one-third. Phosphates sometimes form a thick deposit. I have never detected sugar, and albumen only once—in case 4—where, however, it only amounted to a "trace" in the second week of the dropsy. The *lymphatic glands* in the neighbourhood of the angle of the jaw, and along the anterior border of the sterno-mastoid, are (or at any rate have been in this epidemic) *very frequently* enlarged, not so much, in most cases, as to be visible, but quite appreciable to the touch. There seems scarcely any tendency to pass directly on to suppuration, as is so marked a feature of scarlatina, and when (in measles) they do suppurate, it is *a few weeks after the rash has*

disappeared, and convalescence has been fairly commenced, indeed, as a sequela.

So that, although enlargement of the lymphatic glands in the neck is often present as a symptom, it scarcely ever amounts to a complication even in strumous children. I have seen the parotid enlarged, and the submaxillary glands also. When the enlargement is slight, there is little or no tenderness, but when considerable, the tenderness is very marked. The enlargement may be either unilateral or bilateral.

COMPLICATIONS.

The most important complications of measles, both in regard to number and severity, are various inflammatory affections of the respiratory organs. All those mentioned in the list of cases have been serious, many slight ones having been omitted. Of the 311 cases, 80 suffered from bronchitis, pneumonia, or some other severe chest complication. The complications have occurred much more frequently (in proportion) in those who had previously had a similar inflammatory affection, than in those who had never suffered from any such disease, so that it would appear that having once suffered from an inflammation of the respiratory organs, predisposes to their becoming involved as a complication in measles; sixty of the children had previously suffered, and of this number twenty-three have similarly suffered during the second stage of measles. By "similarly," I do not wish to imply that it was the same disease in both instances, but merely one involving the respiratory organs. (I have not included pertussis.) Now, of all cases of measles these are the most serious, for though a previous attack of bronchitis, &c., does not seem unfavourable, providing

it or another respiratory complication does not complicate the measles, yet if in a case having such a history a pulmonary or bronchial inflammation supervene, it makes the case much more unfavourable, as a large proportion of them prove fatal. Of those who recover, many do so after a long and very exhausting convalescence. Case 23 well illustrates this. This child had often had attacks of bronchitis; the same occurred during the second stage of measles, and continued, with very copious expectoration, six or seven weeks afterwards. These complications may commence at any time during the progress of the disease, and, as a rule, the *earlier* they commence the more serious they are. Some of the worst began early in the *first* stage. We may divide all complications into (a) slight and (b) severe. The slight complications are those that produce inconvenience or disfigurement, but not danger to life. The severe cause danger to life. Sometimes a particular complication is difficult to classify.

A.—*Slight Complications* :—

- (1.) Diarrhoea has seldom occurred in my cases.
- (2.) Constipation was more frequent, and often called for active, though careful, treatment.
- (3.) Tonsillitis was present in 5 per cent.
- (4.) Convulsions occurred during the *first* stage in three cases—all recovered. During the second stage, in seven cases, five of whom died. Death did not result from this complication, however, but, on the contrary, the convulsions, I take it, merely indicated the near approach of death, and resulted from exhaustion.
- (5.) Meningitis has not once occurred.
- (6.) Otorrhoea, I think, has not been seen so frequently

as in previous years, and has not been accompanied by pain, except in three or four cases.

(7.) Ophthalmia has been very common.

(8.) Epistaxis and (9) hemorrhage from bowel occurred in two cases.

In no case did I consider that the high temperature amounted to a complication.

B.—*Severe complications* occurred as follow :—

Complication.	No. of Cases.
Bronchitis . . . . .	. in 29
Broncho-pneumonia . . . . .	. „ 28
Pneumonia . . . . .	. „ 14
Croup . . . . .	. „ 6
Typhoid Symptoms . . . . .	. „ 5
Collapse of Lungs . . . . .	. „ 3
Pleurisy . . . . .	. „ 2
Pleuritic Effusion (abundant) . . . . .	. „ 1
Gangrene of Lung . . . . .	. „ 1
Dropsy, with slight Albuminurea . . . . .	. „ 1

Two or more of the above occasionally occurred in the same child.

They may be classified according to the particular system involved.

I.—*The Respiratory System.*

(a.) *Croup*, bearing a close resemblance to primary true Croup, occasionally occurs during the exanthem, but is far more apt to come on afterwards. I will reserve what I have to say about it until the sequelæ are discussed, merely referring here to the fact that only one case developed croupous symptoms fully during the eruption, and this child died, indirectly however, from the croup.

(b.) *Bronchitis* is the most frequent complication. It often undergoes resolution, but is very apt to extend downwards to the finer bronchioles and produce broncho-pneumonia. It does this so insidiously in the majority of cases, that it is difficult to say exactly when the pneumonic process begins. The bronchitis seems most frequently to arise from careless nursing, especially where it has occurred before. Where it is mentioned in the list, it constituted a dangerous symptom, but it was also present in a mild degree in many other cases.

(c.) *Broncho-pneumonia* occurs very frequently. It is a most dangerous complication, and certainly indicates a depressed state of health, so that we generally meet with it in the worst form amongst the poorest people. About 80 per cent. of the cases in whom it happened were the children of paupers, and most of the others were children who had been "delicate" all their lives, or had recently suffered from bronchitis (viz., within a few weeks). It appears to be dangerous in almost exact proportion to the extent of lung tissue involved, in children of the same age, but a very limited extension of it is more serious in a child about six months old, than a comparatively more extensive attack is in children much older. Some children had the greatest difficulty in overcoming the slightest amount of it. The portion of the lung affected is mostly near the "root." There is invariably great prostration, and convalescence in many cases is slow. The temperature *in a mild case* will reach up to 102° (more or less) in the evenings for nearly a fortnight from its commencement, which usually is during one of the days of the exanthem. (See temperature chart, No. 291.)

(d.) *Lobar pneumonia* is perhaps to be regarded as the *most* dreaded complication, for although it does not

occur so frequently as broncho-pneumonia, it proves fatal in a greater proportion of cases. Most frequently it involves the base, then the apex, and may indeed involve the *whole* of the lung, as in No. 289.

Crisis may occur, but is not either so frequent or so regular in the time of its occurrence as in idiopathic pneumonia. As a rule, the critical day can be predicted with some degree of certainty in the latter ; but when it occurs in measles it may be on the eighth or the sixteenth, or apparently any other day intermediate between these numbers. In many cases the pneumonia has commenced on the day that the temperature has reached its highest point, and the temperature remains high, as in ordinary pneumonia, during the progress of the disease. After the crisis it may be subnormal. The worst case of double pneumonia began several days before the rash appeared. In some of these cases there was more or less broncho-pneumonia along with it, but in others this did not occur.

(e.) *Collapse of lung* is the result (1) of a pneumonic or broncho-pneumonic process ; or (2) may occur principally as the result of pleuritic effusion. The one from the latter cause proved fatal, but the others recovered, one quickly, the other not until after the expiration of about eight weeks. (There was a post-mortem examination of the fatal case. I append my report.)

(f.) *Gangrene of the lung*. I only once diagnosed this. Of course it proved fatal. (I made a post-mortem examination here also. Report appended.)*

(g.) *Pleuritis*. Many complained of pain in some part of the chest, in whom no friction sounds could be

* I may remark here that in this neighbourhood people have a great dislike to these post-mortem examinations, and one has the greatest difficulty in obtaining consent to make them. I have often been disappointed in this respect.

detected, or if they were heard, they were not recognised as such, owing to other (bronchial) sounds. Friction sounds were, however, distinctly audible in one case (No. 289), which was followed shortly afterwards by extensive lobar pneumonia. It appears, as a rule, to undergo resolution without leading to effusion. In one case undoubtedly it was the cause of the fatal termination (No. 90), for it led to

(h.) *Effusion* into the *pleural* cavity. This must have occurred very rapidly, for I did not detect the least amount of it on the last visit, about forty hours before death. It caused complete collapse of the lung on the same side. Death occurred.

II.—*Circulatory System.*

(a.) *Hæmatemesis* occurred in two cases, and in one was the immediate cause of death.

(b.) *Effusion* into the *pericardium*, without roughening of the epithelial lining, was present in the child who died from gangrene of the lung. It was not diagnosed during life, and in that case I do not see how it was possible to detect it.

III.—*Alimentary System.*

Perhaps this is the most suitable place to draw attention to those cases which exhibited

Typhoid symptoms, because the alimentary system is—to judge by the effects at any rate—that which is principally involved. The most marked symptoms in these cases are the continued high temperature, the dry leathery appearance of the tongue, the prostration and the emaciation. The tongue very closely indeed resembles that of true typhoid, and may continue in this

state for two or three weeks, an appearance of moisture being the first sign of improvement in the patient. Sordes are abundant about the lips and teeth. The prostration is very marked, the pulse being almost imperceptible, so that free stimulation (especially with *ammonia*) is called for. The child will take little or no food for days. Vomiting as a rule is absent, and diarrhoea may or may not occur, and in no case has it been serious. In one case these symptoms followed pneumonia (No. 209), in another (No. 4) broncho-pneumonia, in a third they supervened upon the throat affections. In two children (both belonging to same family) this complication came on quite unaccountably, although they had previously been rather "delicate," and were, however, suffering from pertussis at the time of onset of the measles. There was no history of syphilis in any case. Altogether, then, this complication was present in five cases, these being all that exhibited the characteristic symptoms in a typical manner. Marked prostration, of course, as already mentioned, was present in a large percentage of all the cases, but I have not applied the term typhoid (perhaps typhoidal would be better) to such cases, as in them the prostration was due clearly enough to a definite and easily recognisable (secondary) cause, such as broncho-pneumonia. But in the cases where I have applied the term "typhoid," the chain of symptoms invariably supervened *unaccountably*, and just as convalescence seemed on the point of being fairly begun. It appears, therefore, to constitute a distinct complication, *sui generis*, not being dependent upon any other complications. Convalescence is very slow indeed. No relapse occurred in the cases which recovered. In this respect it differs from typhoid or enteric fever, as it also does in not exhibiting the roseola

of the latter ; there is also less tympanitis, and no pain is complained of in the iliac regions. *Erysipelas* occurred in case 42 on the day preceding the rash, but whether it had any connection with the measles or not, I cannot tell, but presume it had not.

THIRD STAGE, OR THAT OF CONVALESCENCE.

This commences in normal cases almost immediately after the disappearance of the rash, but may be, from various causes, indefinitely prolonged. The slight complications retard convalescence very slightly, but the inflammations of the respiratory system and the other complications which I have classed as "severe" have a different effect ; *e.g.*, broncho-pneumonia may continue four or five weeks, and reduce the system to the very lowest ebb, after which convalescence proceeds slowly, and the lost flesh is very gradually regained. More lingering even than this is the progress of typhoid measles, one case (No. 4) having been under treatment for nearly three months.

SEQUELÆ

are very common after measles. Many of the slight affections do not come under observation, so that it is impossible to say with certainty in what proportion of cases they occur. These sequelæ are mostly of an inflammatory nature, and that too of a low type, tending towards disintegration of tissue ; in fact the same depressing feature characterises both the complications and the sequelæ of measles. They may generally be classified according to the system or tissue affected.

I.—*Diseases of the Respiratory Organs.*

(a.) *Lobar Pneumonia.* The sequela to which I wish most particularly to draw attention is a kind of lobar pneumonia, which has occurred in a few of my cases from about the fourth to the eighth week after apparently perfect convalescence, *and which I have not seen described.* The leading features are as follow :—Dulness is *well* marked, and shows that the upper half of the lung is the most prone to be affected ; respiration is rapid, and bronchophony is very marked, reminding one of the sound produced by the phthisis of coppersmiths, &c., but the chief peculiarity noticed was the *total absence of crepitation* until about the fourth day, and after then it was only slightly marked, and coarse *râles* could not be heard during the entire course of the disease. In one case, which was ushered in by convulsions, although dulness was very marked, there was no crepitation from beginning to end, which occurred by crisis on the ninth day, and where the base was involved. A distinct crisis occurred also in another case on the sixteenth day. All recovered.

(b.) *Phthisis* has developed in two children, one of which will probably recover, there being no history of phthisis in the family ; but the other will, in all likelihood, prove fatal, seeing that there is consumption on both sides of the family, as well as cancer on the mother's side (126 and 280), so that in the latter case the measles is perhaps scarcely to be held accountable, should it end as anticipated.

(c.) *Croup.* Though the child is often considered by the parents to have "croup" during the second stage, owing to the *croupy* sound of the cough, it seems, nevertheless, to be comparatively seldom developed during

this stage of measles, and is much more apt to occur about a week after the rash has disappeared, *i.e.*, in a really serious form. I have not performed tracheotomy for this, but would certainly do it in a favourable case.

(*d.*) *Pertussis* in the few cases where it occurred came on early after the disappearance of the exanthem, and was very severe. In one case the child lingered on day after day, became much emaciated, and died six weeks from its commencement. Whether these cases are to be regarded as true whooping cough or not is difficult to say. They differ in some respects from the disease occurring primarily, *e.g.*, no ulcer was visible under the tongue (though this is certainly often absent in *pertussis*), and the whooping, &c., were not any worse through the night than during the day. Still, my cases illustrating this have been too few to base any argument upon.

II.—*Diseases of the Special Senses, or their Accessory Structures.*

(*a.*) *Phlyctenulæ* are exceedingly common.

(*b.*) *Abscess of the upper eyelid* occurred in a few cases.

(*c.*) *Acute Keratitis* leading to loss of sight occurred in one case only, though in a *milder* form it has been more common. In this particular case (No. 14) it commenced fourteen days after the rash. Pus accumulated in the anterior chamber of the eye, and filled the lower half. *Staphyloma* and then perforation of the cornea occurred. At the present time the lower two-thirds of the cornea is occupied by a cicatrix, and there is only the very faintest perception of light. A month or two hence it will be favourable for iridectomy.

(*d.*) *The ear*, I suppose, has suffered about as fre-

quently as in other epidemics, and there is nothing deserving of special remark, except that almost absolute deafness occurred in two cases. In one it soon disappeared, but gradually, and in the other very rapidly during the fourth week, after the discharge of pus from the external meatus. Deafness has not been permanent in any case. In no case have I observed paralysis of motion or of sensation.

III.—*The Alimentary System.*

Constipation. This in case 81 produced alarming symptoms on the tenth day after the rash, when convalescence in other respects was progressing favourably. It had then lasted three days, caused tympanitis, exceedingly flushed face, great irritability and restlessness, and sent the temperature up to 106°, which symptoms caused the medical gentleman who had been called in in my absence to diagnose *pneumonia*, but about four hours after I saw it on this day, the bowels acted (two grains of calomel having been administered by myself), and the temperature, I might almost say, literally *fell* to within a few decimal points of the normal, and the child was virtually quite well again.

IV.—*The Blood Vascular System.*

Anæmia has occasionally been very pronounced, but if no other sequelæ exists, it is easily and speedily cured, seldom lasting more than three or four weeks.

V.—*Lymphatic System.*

Inflammation of lymphatic glands. As already stated, enlargement of these glands are common in the first and

second stage of the disease, but there seems no tendency for them to pass on *then* to suppuration. The case is quite different when they become inflamed a few weeks later, *i.e.*, as a sequela, for in the majority of these cases (so far as I have seen them), they pass on rapidly to the stage of suppuration. They suppurate much more quickly than in scarlatina. The particular glands affected were mostly those below the jaw and along the anterior border of the sterno-mastoid muscles, while in two cases they were the suboccipital glands. One child suffered from an abscess over the glutens maximus, and a still larger one over the inferior angle of the scapula, but in my opinion lymphatic glands were not the starting point. All these cases may be called by the term struma, but no strumous cicatrix has been formed in any case, *i.e.*, the suppuration has ceased speedily, and only a small scar has been left.

VI.—*Diseases of the Skin.*

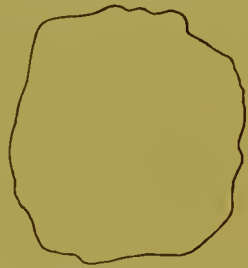
(1.) *Eruptions*.—*Pemphigus* occurred in case 133. It occurred over the whole body, least upon the face. The bullæ came out in successive crops, and when fully formed, were all of almost exactly the same size and shape, *viz.*, circular, and about three-quarters of an inch in diameter. They burst in the centre, and left a bright red raw surface exposed. This child and all its brothers and sisters are strumous. *Furunculus* occurred in two cases.

(2.) *Œdema of prepuce* occurred in one child.

(3.) *Sloughing* has not been extensive in any case. Independently of bed sores (which have been present here and there), mortification of circumscribed patches of skin has occurred in three cases—one on the vulva and two on the scalp. In both these latter cases the

sloughs were quite circular in form, and affected the same region of the head, viz., a little below the parietal eminence. In one case, when the sloughs separated on the seventh week after the rash, there was a surface covered with bright red granulations exposed, and in one of the two patches a small piece of the cranium could be seen. In the other case the slough came off earlier, and about the end of the seventh week after the rash, a piece of the outer table of the parietal bone separated, of the following size and shape exactly. Both cases have made good recovery, so that in only one case has

Necrosis occurred. There is no history of syphilis in this case, but it is worthy of remark that the mother of this child is very delicate, and had kept the child on the breast up to the time of its taking the measles.



Neither Thomas of Leipzig, nor Bristowe, nor Aitken, nor Tanner mentions necrosis of the cranial bones as a sequela of measles.

DIAGNOSIS.

An accurate knowledge of the exact character of measles as distinguished from *rubeola*, or what is misleadingly called "German measles" (*e.g.*, the German Rötheln), as though the two exanthems constitute varieties of one and the same disease—is very desirable at the present time, when many medical men, as I can myself testify, have a habit of calling every case one of "German measles" which seems at all severe or presents sore throat. I believe that medical men, *as a rule*, do not know what are the distinguishing features of *rubeola*,

and consequently declare every case which presents unusual characters, or about which there is some difficulty in making a diagnosis, to be one of "German measles"—this term serving as a convenient cloak for a deficiency of knowledge.

It would also be well to have the terms or names fixed, and not to find the same disease called Rubeola by one, and Rötheln by another. I know one medical man that calls every case of true measles by the name rubeola, whilst this is almost universally called morbilli. For what is called German measles, I think the term "rubeola" preferable to "rötheln," if only for the reason that rubeola is Latin and rötheln German. Now, many in Sunderland have spoken of this epidemic as one of German measles, and in a leading article in the *Sunderland Echo* a few weeks ago, it was stated that "many of the cases are of the variety called German measles or rötheln." One medical man told me in answer to my question as to what he considered the characteristic symptom or symptoms of rötheln, that he formed his diagnosis upon the colour of the rash—if it were very dark (morbilli nigri?) he called it German measles, and then acknowledged that in the same family one child will have a very dark rash, and another child one much paler. Is one rötheln and the other morbilli? I would say not. Another said he called all those German measles which presented sore throat. Is the throat never sore in measles? Far from it.

At a recent meeting of a medical society, I made some remark upon the present epidemic, and asked what was to be considered the main difference between morbilli and rubeola in their symptomatology, and, though there were many men of considerable experience present, no one would hazard an opinion on the subject. The confu-

sion which exists upon this subject was one of the first things that induced me to collect these statistics, in the hope of being able to aid somewhat in clearing up the difficulty: knowing, as I well did, that whatever other differences exist, there is this one fact well established, and acknowledged by almost all authors of the present day—viz., that morbilli and rubeola are two distinct diseases, *and are not mutually protective*, in other words, that an attack of measles does not protect against a subsequent attack of rubeola, and *vice-versa*. (I shall follow the example of Aitken and Thomas of Leipzig, and call German measles “rubeola.”)

Now, be this epidemic measles or rubeola, it is certainly the same disease (the above fact being established) as that from which the brothers and sisters of those affected now have suffered on former occasions, as is shown by the figures in the columns giving the numbers of the children attacked now and previously, together with the total number of children in the family. *E.g.*, on turning to No. 17, we see that of seven children now living three have had the measles now, and *the other* four formerly, and so in other cases, only those (with the few exceptions mentioned earlier on) suffering now who have not done so in previous epidemics. For in every case these numbers refer to *different* children, unless they overlap, as in 115, the total here ($3 + 2 = 5$), showing that one child has twice been affected, there being only four in the family. If this epidemic, then, has been one of a different disease from that which has attacked so many children previously, I cannot see how the immunity of these same children during the present epidemic is to be explained. Indeed, no explanation can be given, but their present exemption is owing to the

fact that this is the same disease, and that there is but little susceptibility to a second attack. The conclusion, therefore, is that this epidemic disease is either measles or rubeola. If rubeola, then all the recent epidemics must likewise have been rubeola, which is not likely. It will be evident from the following remarks (as well as from what I have said before) that it has been neither more nor less than measles of severe type.

No two authors agree precisely in their description of rubeola. The most distinctive and realistic picture which I have had the opportunity of consulting is that of Thomas of Leipzig, in Ziemssens' "Encyclopædia of Medicine." He made a careful study of two epidemics occurring at Leipzig in 1868 and 1872. After the study of his description, it should no longer be possible in typical cases to confound the two diseases, if sufficient care be taken in recognizing the main characters of each. In this article (volume on acute infectious diseases) he declares rubeola to be the "lightest of the acute exanthems" (page 147), so that it is not so serious a disease as measles. Also that "the majority of cases have no fever during the whole course of the disease" (page 145). Such a case has not been under my observation during this epidemic (this character reminds one of roseola). That he has never seen a case "where the eruption was strongly marked" (page 138), and that swelling of the subauricular and superior jugular lymphatic glands are the only constant prodromal symptoms (page 142, quoting Thierfelder).

The diagnostic differences between measles and rubeola, or German measles, may be arranged in a table as follows (based upon Thomas' article):—

PREVALENT IN SUNDERLAND.

	Measles.	Rubeola.
Incubation.	Second attack in a family occurs ten to thirteen days after first.	From two and a half to three weeks after first.
First stage.	Marked catarrh of nose, &c., elevation of temperature lasts four days.	"In normal cases of rubeola, a prodromal stage of more than at most a half day cannot be assumed" (p. 143). "Swelling of subauricular and superior jugular lymphatic glands only constant symptom" (p. 142).
Second stage.	Temperature elevated 3 or 4 degrees as a rule.	"No increase of temperature noticed at beginning of exanthem" (p. 143). "Majority of cases have no fever during whole course of disease" (p. 145).
Spots—colour.	Often very dark.	"I have never seen them where the eruption was strongly coloured" (p. 138).
„ size	Tolerably uniform.	Small spots grouped round larger ones.
„ shape.	Irregular and indented.	"Circular, and as a rule not indented."
„ site.	General.	"Forearms, hands, and lower parts of legs and feet less affected as regards number and closeness, size and colour of the spots."
Tendency to confluency.	Marked.	Slight.
Duration.	Three to five days as a rule.	Less than two days as a rule.
Complications.	Frequent.	Rare.
Sequelæ.	Suppuration of lymphatic glands occur.	"Suppuration of lymphatic glands never been observed" (p. 142).

The above characters of rubeola or rōtheln are sadly at variance with what one reads elsewhere. A glance at the table of differences published in Aitken's "Science and Practice of Medicine," 7th edition, p. 539, will at once indicate some of the main discrepancies: *e.g.*,

there it says that in rubeola the eruption generally breaks out on the third or fourth day, and that it remains from four to ten days.

From the above table, therefore, it is abundantly clear (1st) that the two diseases are quite distinct. (2dly), that in future there should be little or no difficulty in making a diagnosis; and (3dly) that this epidemic is one of ordinary measles, rendered more than ordinarily severe by the widespread distress.

From *scarlatina* the diagnosis may be difficult, if the case be not seen until the rash has begun to fade, and has not remained out as long as usual, and the throat be involved, but the subsequent course or occurrence of it in others in the same family generally makes the nature of the case clear. If the throat be ulcerated, it will almost certainly be due to scarlatina, as I have never seen ulcers on the tonsils in measles. Two only of my cases were doubtful for any length of time; one (No. 11) was clearly measles at first, but the second rash was uncertain, because although it was more like scarlatina than measles, there was a concurrent attack of severe bronchitis. The desquamation eventually proved it to be scarlatina, so that this was a *true case of a "mixed disease,"* not in the nature of the rash, but in the fact that the child was suffering from a complication of measles (viz., bronchitis, which was the probable cause of the disappearance of the rash after the first day), simultaneously with the eruption of scarlatina. The other case was a brother of No. 51, who began fifteen days after her (an unusual interval), and had had measles before. This was shown to be scarlatina by the desquamation and suppuration of lymphatic glands in the neck earlier than in measles, and the subsequent occurrence of two typical cases of scarlatina in the family. I did not see

either this or No. 11 in the first day of the rash. One important sign was absent in both, viz., the miliary papules of measles, which I regard as one of the most important means of diagnosis of measles, though sometimes they are few and far between, and so small that a good eye is required to see them, though they may be abundant. Thomas of Leipzig does not mention whether these papules are present in rubeola, hence I infer that they are absent in that exanthem. I have often, during this epidemic especially, heard the "hybrid disorder" spoken of, meaning that some of these cases here have been intermediate, between measles and scarlatina, such cases being those that presented sore throat, but sore throat has not been nearly so prevalent as we should expect had there been scarlatina connected with it, and tonsillar ulceration would have been common. Two cases (240 and 241) presented some of the features of both diseases. There was sore throat, and a rash smaller than that of the measles, and of a scarlet colour, seeming to point to scarlatina, but on the other hand there was conjunctivitis (with chemosis) and swelling of eyelids to such an extent that they could not be separated, and the elder had severe bronchitis; these pointed to measles. The room was so badly lighted (and so pervaded with disagreeable odours) that I could not detect either the miliary papules or ulceration of the throat. However, the desquamation was branny, and a typical case of measles occurred in the youngest child of the family (243) on the eleventh day afterwards. They were therefore all three cases of measles. Hence we must not jump to the conclusion that a case is scarlatina from the mere fact that the throat is involved, how severely soever it may be affected, *short of ulceration*, nor that it is the "mixed disease." It is only necessary to refer

to two other cases under this head. Both were infants only a few weeks old, and were supposed by the mother to have measles. Measles was in the house at the time, but both these were simply well-marked cases of lichen.

PROGNOSIS.

There are three chief points to consider in forming or expressing an opinion of the future history of a case of measles.

(1.) *The age of the child.* As a rule, the prognosis is more favorable the older the patient. It is very fatal from six to twelve months.

(2.) *Its previous history.* Respiratory complications occur most frequently in those who have suffered from a disease of the respiratory organs previously, and these cases are certainly grave, many proving fatal.

(3.) *The general condition at the outbreak of the exanthem.* The great majority of those that are in a favourable condition at the time the rash makes its appearance go on favourably; and it will generally be found that there is some indication of a complication by this time if it occur at all.

The most favourable cases are those in healthy children, where the body is fairly well covered with a rash of an average depth of colour.

TREATMENT.

Many cases require no medicinal treatment. Strict attention to cleanliness—a tepid bath twice daily—a well-ventilated room, with temperature 60° to 65° , and what food the child desires, is all that is required.

Few of my cases in this epidemic, however, have been

such as to require no special treatment. A large number, in addition to those suffering from serious complications, have needed the greatest care.

There is one main factor which is to be our guide in treating all cases of measles, viz., that there is a very marked tendency to prostration. From careful observation, I can assert positively that *ammoniac carbonas* is the drug which above all others will give us satisfaction. It should be administered in small but frequent doses every hour, or much oftener in certain cases. It is well borne by young children suffering from broncho-pneumonia.

When this complication is very severe, a wet pack, cold, as described by Thomas (p. 104), is serviceable, but it is very seldom, indeed, that mothers can be persuaded to adopt so "harsh" a means.

For *constipation*, *Sulph. Precip.* is best. Diarrhœa is generally speedily relieved by small (2 gr.) doses of zinc. oxid. post. singulas. sedes. liquidas. Restlessness is generally at once relieved by a very warm bath.

For *croup*, alum every half-hour is undoubtedly the best remedy.

RESULTS.

Of the 311 cases, 25 have proved fatal, or a percentage of 8·03. The following table shows at what periods they occurred :—

AGE.	NUMBER OF CASES.	NUMBER OF DEATHS.	PERCENTAGE.
Under 1 year, .	29	8	27·6
Between 1 and 2 years,	39	7	18 nearly.
Above 2 years, .	243	10	4·1
Total .	311	25	8 03

The deaths are to be attributed in nearly every case to an impoverished condition of the system beforehand. In seventeen of the cases the father had been several months out of employment; a few were the children of poor widows.

Below I give the various secondary causes of death, or rather that which was the more immediate cause of death, for in the case where hæmatimesis proved fatal, there had been for several days extensive broncho-pneumonia.

Complication.	No. of Deaths.	
Pneumonia, . . .	8	} Respiratory Diseases, 20.
Broncho-pneumonia, . . .	6	
Bronchitis, . . .	3	
Pleuritic effusion, . . .	1	
Croup, . . .	1	
Pertussis, . . .	1	
Exhaustion, with other complication, .	2	
Typhoid symptoms, . . .	1	
Hæmatimesis, . . .	1	
Abscesses, . . .	1	
Total . . .		25

Broncho-pneumonia was also present in the case of pleuritic effusion, as well as two or three of the cases of pneumonia. This table shows that lobar pneumonia has proved the most fatal complication: of the fourteen who suffered from this complication (see p. 31), eight proved fatal, whilst only six of the twenty-eight who got broncho-pneumonia succumbed.

Now that the epidemic is subsiding, there is quite a noticeable modification in the general character of the cases: they are *milder* than they were at the earlier part

of the epidemic, and in comparison need but little treatment. I believe also that fewer have the very dark rash (*morbilli nigri*) which characterised nearly all the first cases. I append a return of deaths furnished me by the Medical Officer of Health for the Borough. It shows the number of deaths (from measles alone) during each week from January 3rd to April 11th. Nearly half (155) of the total (325) have been in Bishopwearmouth North. And three or four weeks since the proportion was much larger, because, as will be seen, from that time the disease has been decreasing here, whereas it has increased in Bishopwearmouth South.

I also append the report of two necropsies and three temperature charts.

P.S.—Since my prognosis of the case of phthisis (No. 280 in the list), given on page 41 of this thesis, the child has died.

POST-MORTEM EXAMINATION OF BODY OF JAMES M.—
CASE 90.

Thorax. Left ribs incised first, no escape of fluid; then right ribs divided, and straw-coloured fluid escaped immediately. Right pleural cavity filled with serum, in which a few flocculi were floating. Right lung completely collapsed, no crepitation. Posterior part of base hepatised (red) from broncho-pneumonia. Middle portion at back inflamed, and pleura over it roughened, recent lymph adhering to it; serum = 6 oz. Left lung, lower third hepatised.

P. M.—CASE 79.

Thorax. Right lung, lower half infiltrated with pus, which oozed out freely on section; the whole of posterior

part in same condition. Left lung : front edge of middle portion, $1\frac{1}{2}$ inch long, and 1 inch wide, gangrenous. Pericardium contained 5 dr. of clear serum, but no evidence of pericarditis (beyond this).

I have not deemed it necessary to give any further particulars of these cases.

BOROUGH OF SUNDERLAND.—DEATHS FROM MEASLES.

WEEK ENDING	SUNDERLAND EAST.			SUNDERLAND WEST.			BISHOPWEARMOUTH NORTH.			BISHOPWEARMOUTH SOUTH.			MONKWEARMOUTH.			WHOLE BOROUGH.			TOTALS.
	Under 1.	1 to 5.	Over 5.	Under 1.	1 to 5.	Over 5.	Under 1.	1 to 5.	Over 5.	Under 1.	1 to 5.	Over 5.	Under 1.	1 to 5.	Over 5.	Under 1.	1 to 5.	Over 5.	
January 3 .	...	...	...	...	...	...	...	...	...	1	...	...	...	...	1	1	...	1	2
" 10 .	...	...	...	...	...	...	...	1	...	...	...	...	...	1	...	...	2	...	2
" 17 .	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	3	1	5
" 24 .	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	4	1	6
" 31 .	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	6	3	10
February 7 .	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	4	4	12
" 14 .	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1	2	6	1	21
" 21 .	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	3	3	3	26
" 28 .	...	2	...	...	...	...	...	...	...	2	...	...	...	...	6	6	22	1	29
March 7 .	1	1	...	...	...	...	...	...	...	2	...	...	...	...	6	6	34	2	42
" 14 .	...	1	...	...	...	...	...	...	...	2	...	...	...	...	10	10	30	5	45
" 21 .	1	...	...	...	...	...	...	...	...	1	...	...	...	...	10	10	32	8	50
" 28 .	1	...	...	...	...	...	...	...	...	2	...	...	...	...	5	5	25	3	33
April 4 .	...	2	...	...	...	...	...	...	...	2	...	...	...	...	5	5	22	3	30
" 11 .	...	2	...	...	...	...	...	...	...	...	...	...	...	...	1	1	11	1	13
" 18 .	...	1	...	...	...	...	...	...	...	1	...	...	...	...	2	2	16	1	19
" 25 .	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	11	...	11
May 2 .	"	1	...	...	...	...	...	...	...	1	...	...	...	...	1	1	3	...	4
" 9 .	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	6	...	6
" 16 .	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4
" 23 .	...	...	...	...	...	...	...	...	...	1	...	...	...	...	1	1	5	2	5
" 30 .	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	2
June 6 .	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2
" 13 .	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	4	14	5	3	23	2	23	123	17	17	63	7	13	57	9	60	279	40	379

The table given in thesis sent to University showed deaths up to April 11th only.

LIST OF CASES.

NUMBERS BRACKETED TOGETHER BEGAN SIMULTANEOUSLY, THUS—

HORIZONTAL LINES SEPARATE THE CHILDREN OF DIFFERENT FAMILIES.

No.	Interval in Days.	If previously had measles.	No. of children in family.	No. attacked now.	No. attacked previously.	Age.	PREVIOUS HISTORY.	Duration in Days of		First site of Exanthem.	Tongue.	Throat.	Urine.	Vomiting when.	Convulsions when.	COMPLICATIONS.	SEQUELÆ.	RESULT.
								1st stage.	2nd stage.									
1 } 2 }	... ...	... ...	5 ...	2 ...	3 ...	8 4	Tonsillitis. ...	10 4	3 7	Face. Face.	... ...	Sore. ...	... ...	1st stage. ...	... ...	... ...	... ...	Recovery. "
3 } 4 }	... ...	... ...	3 ...	3 ...	... ...	6 ⁶ 5 ⁶	Croup 2 yrs. ago. Bronchitis. Convulsions and frequent Bronchitis.	3 3	4 4	Arms and trunk, face 3rd day. General.	Dry and cracked. ...	Sore. ...	Urates. Traces of albumen.	2nd. ...	2nd. ...	Throat so inflamed that swallowing almost impossible; typhoid; desquamation in fine scales. Broncho-pneumonia, prostration, emaciation, typhoid symptoms, no diarrhœa; dropsy as convalescence began; no albuminuria at first, then traces.	6 weeks after Dropsy, &c.	Recovery. "
5	14	...	...	...	...	3	Pertussis.	3	6	Face.	...	...	...	...	...	...	...	"
6	...	...	4	4	...	6	Pneumonia thrice.	4	4	Back.	Dry, cracked, very sore.	...	Urates very abundant.	...	...	Double pneumonia began day after rash disappeared; lasted 7 days.	...	"
7 } 8 } 9 }	11 13 13	... ... ...	... ... ...	... ... ...	... ... ...	3 6 ⁶ 4	Bronchitis. Good. Good.	7 4 4	3 3 3	Back. ... ...	... ... ...	... ... ...	... ... ...	... ... ...	... ... ...	... ... ...	... ... ...	" " "
10	...	...	2	1	...	2	Pneumonia.	14	4	Back.	...	Sore.	Urates.	...	...	...	...	"
11 12	... 12	... ...	2 ...	2 ...	... ...	2 5	Good. Good.	7 5	4 1	Chest. General, scarlatina pale punctate.	Ulcerated.	... ...	Urates abundant.	1st	... ...	Severe bronchitis before rash first went in; desquamation large <i>Mac</i> es.	... ...	" "
3 } 1 } 1 } 15 }	... ... ... ...	... ... ... ...	4	4 ... ... ...	... ... ...	2 ... 8	Recent loss of flesh. Good. Good.	1 1 1	3 3 2	Face. Face. Face.	... ... ...	... ... ...	... ... ...	... ... ...	... ... ...	Pneumonia. ... ...	... Note a. ...	" " "

a Keratitis; accumulation of pus in anterior chamber of eye; began 14 days after; staphylococci over lower eyelid; of cornea.

* Returned after 5 days.

16	10	...	...	...	5	Good.	1	2	Face.	...	...	...	...	...	...	...	...	Recovery.
17	...	...	7	3	4	1-9	3	9	Breast large and very dark.	...	...	...	...	...	...	...	Lymphatic gland on right side enlarged considerably. (Pertussis not returned.)	...
18	11	...	...	...	...	5	4	10	Face faded three times and returned.	Dry and cracked.	...	...	...	...	...	...	Typhoid symptoms; severe diarrhoea lasting 8 days; slow convalescence.	...
19	11	...	...	...	...	3	4	10	Face.	...	...	...	...	...	...	...	Typhoid symptoms.	...
20	...	...	8	3	5	7	1	4*	Face.	...	...	...	...	...	...	...	Broncho-pneumonia lasted 3 weeks; profuse discharge from ears.	...
21	14	...	...	...	...	3	4	3	Face.	...	...	...	...	...	...	...	Glands much enlarged on left side.	...
22	14	...	...	...	...	6	2	3	Face.	...	...	...	...	...	...	...	Profuse discharge from ears; large ulcers on lips.	...
23	...	Yes	3	1	3	9	2	3	Face.	...	...	...	...	...	...	...	...	...
24	...	...	6	1	5	3	0	6	Face and neck.	Ulcers.	...	Urates.	...	...	...	...	Bronchitis 2nd stage.	Recovery.
25	...	...	5	3	2	6	7	3	Chest.	...	...	Urates.	...	...	...	...	...	...
26	...	...	...	...	...	8	3	2	Neck and breast.	...	...	Urates.	...	...	...	...	...	...
27	13	...	...	...	...	2-6	4	3	Abdomen.	...	...	...	1st.	...	...	...	...	...
28	...	...	5†	1	2	2	3	4	Face.	...	...	...	...	...	...	...	Note a	...
29	...	...	2‡	1	...	6-6	3	3	Neck.	...	...	Clear, &c.	2nd.	...	...	...	...	...
30	...	...	4	1	3	1-9	2	6	Face.	...	...	Urates.	1st.	2nd.	...	...	Diarrhoea, first stage and 2nd. Pneumonia began third day of rash, ushered in by convulsions.	...
31	...	...	2‡	1	...	3-9	3	4	Face.	...	...	Clear, &c.	1st.	2nd.	...	...	Constipation in 2nd stage.	...

† Baby 10 weeks old escaped.

‡ 2 have escaped, aged 4 and 7.

* They returned after 5 days and lasted 2.

§ Baby 3 months old escaped.

a Gland enlarged, right side, 3 weeks after.

No.	Interval in Days.	If previously had Measles.	No. of children in family.	No. attacked now.	No. attacked previously.	Age.	PREVIOUS HISTORY.	Duration in Days of		First site of Exanthem.	Tongue.	Throat.	Urine.	Vomiting when.	Convulsions when.	COMPLICATIONS.	SEQUELÆ.	RESULT.
								1st stage.	2d stage.									
32	...	...	5	3	2	5 ⁶	Bronchitis 4 times, pertussis.	4	2	Face.	...	...	...	...	...	Pneumonia began in 2nd stage.	...	Died 9th day.
33	...	...	...	...	...	3 ⁶	Scarlatina, pertussis.	3	2	Face.	...	...	...	...	...	...	...	...
34	...	...	...	1	...	1 ⁶	Good.	0	2	General.	...	...	...	...	...	...	...	Recovery.
35	...	...	5	2	3	6	Good.	14	5	Face very dark.	...	...	Clear, &c.	1st.	...	...	...	...
36	12	...	...	...	...	3	Good.	7	5	Face very dark.	...	...	Clear, &c.	...	Note <i>a</i>	...	...	...
37	...	...	7	1	6	1	Good.	5	2	Forehead and arms, but <i>very</i> slight.	...	...	Healthy.	...	...	Oedema of prepuce, lasting 3 weeks.	Note <i>b</i>.	...
38	...	...	3	2	...	1 ⁶	Good.	...?	10	Face.	...	...	...	1st and 2nd.	...	On last day of rash, a black spot found near juncture of sagittal and lambdoid suture, sloughing, bone laid bare, skin having shelving edges; no history of syphilis.	Note <i>c</i>.	...
38a	...	...	...	...	...	4	Good.	4	7	General.	...	...	...	...	...	...	...	...
39	...	...	3	1	...	0 ⁹	Good.	1	6	Back.	...	...	...	2nd.	...	...	...	...
40	...	...	6	4	2	8	Good.	6	4	Face and neck.	...	...	...	2nd.	...	Frequent epistaxis.	...	...
41	10	...	...	...	...	4	Good.	3	3	Face.	...	...	...	...	...	...	...	...
42	12	...	...	...	...	1 ⁶	Good, but erysipelas 1 month ago.	...?	3	Face.	...	...	...	...	1st day of rash.	Erysipelas last day before rash appeared.	...	...
43	12	...	...	...	...	6	Good.	...?	3	Face.	...	...	...	...	...	...	...	...

a Severe when rash appearing.*b* Four weeks after a rash, with military papules and vesicles, appeared on arms, neck, forehead, and trunk, on two successive mornings. On third day papules, but no rash.*c* Sequelæ of outer table of posterior inferior angle parietal separated 7 weeks afterwards.

44)	...	...	3	3	7	Erysipelas 2 yrs. ago; pertussis 3 yrs. ago.	4	3	Neck.	...	...	...	...	...	...	...	...	Recovery.
45	...	...	...	...	5	Pertussis, bronchitis.	6	3	Legs, large blotches.	...	...	...	...	...	...	...	...	"
46)	...	...	...	...	1 ¹⁰	Bronchitis.	4	3	General punctates.	...	...	...	...	...	...	...	...	"
47	...	...	5	2	3 ⁶	Good.	3	5	Abdomen, very dark and abundant.	...	...	...	...	...	...	...	...	"
48	...	...	...	...	1 ²	Good.	5	3	Face.	...	...	...	...	...	...	...	...	"
49)	...	...	5	2	6	Scarlatina 1 year ago; bronchitis.	14	4	Neck and chest.	...	...	...	...	...	...	...	...	Recovery.
50)	...	...	...	...	7	bronchitis, pertussis.	14	4	General.	...	...	...	...	...	...	...	...	"
51	...	...	4	1	1 ¹⁰	Good.	3	5	Arms.	...	...	...	...	...	...	...	...	"
52)	...	...	3	1	6	Good.	10	4	Face.	...	...	...	...	...	...	...	...	"
53)	...	...	...	...	...	Had all the catarrhal symptoms without exanthem; no bronchitis; confined to bed 7 days.	...	...	...	...	...	...	...	...	...	...	...	"
54	...	...	5	3	6	Pertussis.	6	3	Chest.	...	...	...	...	...	...	...	...	"
55)	13	...	...	...	4	Pertussis.	6	4	Chest.	...	...	...	...	...	...	...	...	"
56)	13	...	...	...	1 ⁶	Pertussis.	3	3	Legs.	Dry and black.	...	...	...	...	...	...	...	"
57	...	...	...	...	...	All catarrhal symptoms; tumefaction of face; conjunctivitis 6 days; no exanthem.	...	...	...	...	...	...	...	...	...	...	...	"
																		Died 8th day.
																		Recovery.

No.	Interval in Days.	If previously had Measles.	No. of children in family.	No. attacked now.	No. attacked previously.	Age.	PREVIOUS HISTORY.	Duration in Days of		First site of Exanthem.	Tongue.	Throat.	Urine.	Vomiting when.	Convulsions when.	COMPLICATIONS.	SEQUELÆ.	RESULT.
								1st stage.	2nd stage.									
58	...	...	3	3	...	6	Mumps, severe bronchitis, typhoid, followed by pleuritis and emphysema. I made free incision 2 months ago; perfect recovery—rapid.	4*	3	General.	...	...	...	1st.	...	...	...	Recovery.
59	2, 13	...	...	...	...	3	Bronchitis.	3	1+	Back.	...	...	...	...	...	...	...	"
60	9	...	...	...	...	8	Scarlatina 2 yrs. ago.	7	3	General.	...	...	...	...	...	...	...	"
61	...	...	4	3	...	4	Inflammation of lungs, pertussis.	4	6	Face.	...	...	...	...	...	Croup, bronchitis.	...	Died 13th day.
62	13	...	...	...	...	1	Good.	2	8	Face.	...	...	...	...	...	...	...	Recovery.
63	13	...	...	...	...	11	Pertussis, pneumonia.	1	2	Face.	...	...	...	1st.	...	...	...	"
64	...	...	5	3	...	4 ⁶	Bronchitis.	4	3	Face	...	...	...	1st, 2d	...	Severe inflammation of eyelids.	...	"
65	13	...	...	...	...	3	Good.	6	4	Face.	...	...	...	...	...	...	...	"
66	13	...	...	...	...	1	Good.	6	4	Face.	...	...	...	...	...	...	...	"
67	...	...	2	2	...	3 ⁶	Varicella.	4	8	Neck.	...	Sore.	...	1st, 2d	...	Glands enlarged on both sides of neck.	...	"
68	...	...	...	...	...	1 ⁴	Bronchitis.	5	1	Face and neck only.	...	...	...	...	...	...	...	"
69	...	...	5	3	2	5	Good.	7	3	Face.	...	...	...	...	...	Extensive broncho-pneumonia began 2nd day of rash; lasted 8 days.	...	"
70	...	...	...	...	...	3	Good.	2	4	Face.	...	...	...	...	...	Broncho-pneumonia, as in above.	...	"
71	...	...	...	...	...	2	Good.	2	3	Face.	...	...	...	...	...	...	...	"
72	...	...	3	1	2	4	Good.	6	3	General	...	...	...	...	...	...	...	"

* Sudden "croup" at school.

† Well 10 days, then returned for 3.

73	...	...	7	3	3	8	Severe bronchitis 3 times; pertussis.	4	3	Face.	...	...	...	Urates.	1st.	...	...	Marked anaemia.	Recovery.
74	10*	...	...	...	...	3	Bronchitis.	4	4	Back.	...	...	...	Phosphates. Healthy.	1st.	...	...	...	"
75	11	...	...	...	...	6	Good.	4	4	Face.	...	...	...	...	...	...	...	...	"
76	...	...	6	2	4	6	Good.	?	4	General.	...	...	...	...	...	...	...	...	"
77	...	...	...	...	...	0.7	Pneumonia when 3 months old.	8	4	Back.	...	...	...	...	...	...	...	...	Died 4th day.
78	...	...	6	2	3	5	Good.	3	3	Back.	...	...	...	...	1st.	...	...	...	Recovery.
79	11†	...	...	...	...	3	Good.	6	5	Face and neck.	...	...	...	...	...	...	...	...	Died 17th day.
80	...	...	1	1	...	2	Good.	3	3	General.	...	...	...	...	...	...	...	...	Recovery.
81	...	...	1	1	...	5	Pneumonia, laryngismus stridulus.	14	4	Feet.	...	...	Sore.	...	1st, 2nd.	...	...	Note a	Recovery.
82	...	...	3	3	...	7	Scarlatina and varicella.	7	2	Face.	...	...	...	...	...	...	...	...	"
83	...	...	...	...	...	5	Scarlatina.	5	4	General.	...	...	...	...	1st.	...	...	...	"
84	2	...	...	...	...	2	Good.	5	4	General.	...	...	...	...	...	...	...	...	"
85	...	...	7	2	2	7	Good.	4	5	Face very dark.	...	...	...	...	...	...	...	...	"
86	13	...	...	...	...	3	Good.	3	3	Face.	...	...	...	...	...	...	...	...	"
87	...	...	8	4	4	2 ⁶	Good.	7	4	Back.	...	...	...	...	1st.	...	...	...	"

* Baby born during rash in No. 73 has escaped.

† Baby five months old has escaped.

a Eleven days after, constipation, intestinal irritation, temp. 105.8; next day, 98.2.

No.	Interval in Days.	If previously had Measles.	No. of children in family.	No. attacked now.	No. attacked previously.	Age.	PREVIOUS HISTORY.	Duration in Days of		First site of Exanthem.	Tongue.	Throat.	Urine.	Vomiting when.	Convulsions when.	COMPLICATIONS.	SEQUELÆ.	RESULT.
								1st stage.	2nd stage.									
88	3	...	...	...	...	7	Good.	4	3	...	...	..	...	1st.	...	...	...	Recovery.
89	3	...	...	...	...	6	Good.	4	3	...	...	...	...	1st.	...	...	...	"
90	12	...	...	...	...	0.9	Good.	6	3	Face.	...	...	...	...	...	...	...	" Died 15th day.
91	...	...	3	2	1	6	Bronchitis.	3	5	Face very dark.	...	...	...	...	...	...	...	Recovery.
92	6	...	...	...	...	5	Good.	3	5	Face very dark.	Dry.	...	...	...	...	Broncho-pneumonia, typhoid, hemitamesis.	...	Died 15th day.
93	...	...	3	2	0	8	Scarlatina.	4	3	Face dark.	...	...	...	1st.	...	...	...	Recovery.
94	13	...	...	...	...	6	Bronchitis.	6	1	Face only; large dark patches.	...	...	...	...	...	Broncho-pneumonia.	...	Died 10th day.
95	...	...	5	1	4	1	Bronchitis.	7	5	Trunk.	...	...	...	...	...	Bronchitis.	Note <i>a</i>	Died.
96	...	...	5	3	2	4.6	Good.	3	7	General.	...	...	...	1st, 2nd.	...	...	...	"
97	2	...	...	...	...	3	Good.	7	1	Face.	...	...	...	1st, 2nd.	...	...	...	"
98	2	...	...	...	...	1.1	Good (boils.)	2	8	Face.	...	...	...	...	...	...	...	"
99	...	...	7	2	4	3	Bronchitis.	7	4	...	...	...	...	1st.	...	...	...	"
100	14	...	...	...	...	0.4	Good.	6	5	Face.	...	...	...	...	...	...	...	"
101	...	...	2	2	...	2.6	Good.	7	3	General.	...	...	...	...	...	...	Note <i>b</i>	"
102	...	...	...	...	...	0.9	Good.	1	4	General.	...	...	...	...	...	...	...	"
103	...	...	4	2	2	5	Good.	3	2	Face.	...	...	...	...	...	...	...	"
104	10	...	...	...	...	2	Good.	6	3	Face.	...	...	...	...	...	...	...	"

a Large abscess over lower half of scapula, began 3 weeks after; sub-acute; another in left gluteal region.

b Inflammation of gland on right side of neck began 1 month after; lanced on 7th day; healed on 13th.

105	...	...	5*	1	3	3-6	Good.	4	3	Face.	...	...	...	...	...	...	...	...	...	Died.
106	...	...	3	3	...	1-6	Good.	3	4	Face.	Note <i>b</i>	...	...	...	...	...	...	...	...	Recovery.
107	10	...	...	...	...	5	Intermittent fever.	5	3	Face.	...	...	...	...	...	...	...	...	...	...
108	14	...	...	...	...	3	Good.	7	4	Face.	...	...	...	...	...	...	...	...	...	...
109	...	...	4	4	...	6	Good.	3	3	Face.	...	...	...	...	...	...	...	...	...	...
110	7	...	...	...	...	5-6	Good.	3	3	Face.	...	...	...	...	...	...	...	...	...	...
111	13	...	...	...	...	2-3	Pertussis, bronchitis.	3	3	General.	...	...	...	...	...	...	...	...	...	...
112	13	...	...	...	...	0-7	Good.	3	3	...	...	...	...	...	...	...	...	...	...	...
113	...	...	4	2	3	5	Scarlatina.	2	3	Face.	...	...	...	...	...	...	...	...	...	...
114	3	...	...	...	...	3	Bronchitis.	3	2	Back.	...	...	...	...	...	...	...	...	...	...
115	...	Yes.	4	3	2	7	Measles 5 years ago.	6	3	Face.	Sore.	...	...	...	...	...	...	...	...	...
116	11	...	...	...	...	4	Good.	2	5	Face.	...	...	...	...	...	...	...	...	...	...
117	10	...	...	...	...	1	Good.	1	6	Face.	...	...	...	...	...	...	...	...	...	...
118	...	...	6	4	2	6	Bronchitis.	6	6	General; very dark.	...	...	...	...	...	...	...	...	...	...
119	...	...	...	...	...	9	Scarlatina.	3	4	Face and back, dark.	...	Urates; abundant.	...	...	...	...	...	...	...	...
120	11	...	...	...	...	4	Scarlatina.	3	4	Face very dark.	...	...	1st.	...	...	...	...	...	...	...
121	11	...	...	...	...	2	Good.	3	4	Face dark.	...	...	...	...	...	...	...	...	...	...
122	...	...	5	5	...	7	Good.	4	2	Neck	...	...	...	...	...	...	...	...	...	...
123	2	...	...	...	...	5	Good.	2	2	Face	...	...	...	...	...	...	...	...	...	...
124	12	...	...	...	...	3	Good.	1	6	Face	...	...	...	...	...	...	...	...	...	...
125	12	...	...	...	...	9	Diphtheria.	7	6	Back	...	...	...	...	...	...	...	...	...	...
126	12	...	...	...	...	0-11	Good.	4	4	Forehead.	Note <i>c</i>	...	...	...	...	...	...	...	Phthisis.	...
127	...	...	3	2	1	3	Good.	6	4	General.	...	...	...	...	...	...	...	...	...	...
128	12	...	...	...	...	0-10	Bronchitis.	...	3	Back.	...	...	...	...	...	...	...	...	...	...

* Baby 6 weeks old has escaped.

a Ulcers on tongue and mouth.

b Sore; breathing obstructed.

c Ulcer on tip; also 2 on palate, placed symmetrically

No.	Interval in Days.	If previously had Measles.	No. of children in family.	No. attacked now.	No. attacked previously.	Age.	PREVIOUS HISTORY.	Duration in Days of		First site of Exanthem.	Tongue.	Throat.	Urine.	Vomiting when.	Convulsions when.	COMPLICATIONS.	SEQUELÆ.	RESULT.
129	...	...	3	3	0	6	Pertussis.	5	2	Face very dark.	...	...	...	...	...	Glands (cervical) enlarged.	...	Recovery.
130	10	...	...	...	...	5	Pertussis, varicella, bronchitis.	3	7	Face very dark.	...	...	...	...	...	...	...	"
131	10	...	...	...	...	1-6	Pertussis.	3	7	Face very dark.	...	...	...	...	...	...	...	"
132	...	Yes.	9	2	8	7	Measles 4 years ago; no doctor attended; scar-latina.	3	5	Facedark.	...	...	...	...	...	...	...	"
133	...	...	...	...	...	5	Scrofulous.	4	5	Facedark.	...	...	...	...	...	...	Note a	"
134	...	...	3	3	...	7	Good.	7	3	Trunk very dark.	...	Sore.	...	...	...	Glands visibly enlarged on both sides.	...	"
135	...	...	...	...	...	4	Good.	6	3	Face very dark.	...	Sore.	...	...	...	...	...	"
136	11	...	...	...	...	2	"Always delicate on the chest."	1	3	Face very dark.	...	...	...	...	...	Extensive broncho-pneumonia.	...	Died 12th day.
137	...	...	7	3	1	7	Congenital syphilis; palate; (hard), perforated.	7	5	Face.	...	...	...	...	...	...	...	Recovery.
138	...	...	...	...	...	5	Good.	?	5	Back.	...	...	...	...	...	Submaxillary gland enlarged.	...	"
139	10	...	...	...	...	3	Good.	4	4	Face and back.	...	...	...	...	...	...	...	"
140	...	...	6*	2	2	4	Bronchitis.	5	3	?	...	Sore.	...	...	...	Glands enlarged on both sides; broncho-pneumonia.	..	"
141	...	...	...	...	...	1-5	Good.	2	3	Back.	Note b	...	...	...	...	...	..	"

a Pemphigus began 7 days after rash; successive vesicles, $1\frac{1}{2}$ inch in diameter, over entire body; lasted 7 weeks; skin stained.

b Ulcer on tip; another right across middle.

* Baby three months old has escaped.

142	...	...	3	3	...	3, ⁶	Under treat- ment 2 months for tubercular meningitis ; paralysed on left side; loss of sight. (Good. Bronchitis.	?	2	Face.	...	...	...	...	...	(Very slight case. Died 2 months after from tubercular menin- gitis.)	...	Recovery.
143	3	...	...	...	...	0. ¹⁰	Good. Bronchitis.	2	2	Face.	...	...	...	...	...	...	...	Recovery.
144	3	...	...	...	...	4. ⁶		3	4	Face.	...	...	...	...	...	...	...	Recovery.
145	...	...	3	2	1	6	Good. Good.	4	3	Trunk. General.	...	...	...	...	...	...	...	Recovery.
146	7	...	...	...	...	1. ⁶		4	4	Face. Face.	...	...	...	...	...	...	...	Recovery.
147 } 148 }	...	...	6	2	4	2. ⁶ 7	Bronchitis. Pertussis.	2	2	Face. Face.	...	...	...	...	...	...	...	Recovery.
149	...	...	4	3	1	3		8	3	General.	...	...	...	...	...	...	...	Recovery.
150 } 151 }	10 10	...	...	...	...	3 0. ⁶	Good. Good.	5 2	2 4	Face. Face.	...	...	...	...	...	...	...	Recovery.
152	...	...	4	2	2	5		4	3	Face. Face slight.	...	...	...	...	...	...	...	Recovery.
153	10	...	...	...	...	6	Good. Good.	4	1½	Face slight.	...	...	...	...	...	...	...	Recovery.
154	...	...	2	2	...	4		4	3	Neck and face. Face.	...	...	...	...	...	...	...	Recovery.
155	...	...	...	...	...	1. ¹¹	Pertussis. ?	4	3	Face. Face.	...	...	...	...	...	...	...	Recovery.
156	...	...	2	2	...	3. ⁶		4	3	Face. Face.	...	...	...	...	...	...	...	Recovery.
157	Few hrs.	...	...	...	...	0. ⁷	Good. Good.	4	2	Face. Face.	...	...	...	...	...	...	...	Recovery.
158 } 159 }	...	...	3	3	...	7		2	3	Face. Face.	...	...	...	...	...	...	...	Recovery.
160 }	6	...	...	...	...	4	Pertussis.	2	3	Face.	...	...	...	...	...	...	...	Recovery.
161	...	...	1	1	...	2		3	1	Face.	...	...	...	...	...	...	...	Recovery.

No.	Interval in Days.	If previously had Measles.	No. of children in family.	No. attacked now.	No. attacked previously.	Age.	PREVIOUS HISTORY.	Duration in Days of		First site of Exanthem.	Tongue.	Throat.	Urine.	Vomiting when.	Convulsions when.	COMPLICATIONS.	SEQUELÆ.	RESULT.
								1st stage.	2nd stage.									
162	4	1	3	5	Good.	4	2	Face.	...	...	...	...	...	...	Croup 2d week.	Recovery.
163	2	2	...	1 ⁶	Pneumonia; always very delicate.	7	...	Nose.	...	...	...	...	...	Pneumonia first; all usual symptoms were present except rash. Bronchitis.	...	Died before rash appeared.
164	4	Good.	5	3	Face.	...	...	...	...	...	...	...	Recovery.
165	3	3	...	6 ⁶	Pertussis; chicken pox 2 weeks ago.	3	5 or 6 hrs.	General; dark.	...	...	...	...	...	Very severe broncho-pneumonia immediately after rash went in; in imminent danger for 3 weeks. Bronchitis.	Note <i>a</i>	"
166	5	Pertussis, &c., with above.	2	2	Face dark.	...	...	...	...	...	...	...	"
167	13	...	...	...	...	3	Pertussis, &c., with above.	3	4	Face.	...	...	...	...	...	Very severe broncho-pneumonia as in 165; parotitis, which underwent resolution.	Note <i>b</i>	"
168	...	Yes	8	3	7	5 ⁶	Measles 4 yrs. ago; no doctor attended; scar-latina.	5	5	Face.	...	...	...	1st.	...	...	Glands in left side enlarged.	"
169	...	Yes	...	...	...	7	Measles 4 yrs. ago; no doctor attended; scar-latina.	1	5	Face.	...	...	...	1st.	...	...	...	"
170	13	...	...	...	...	4	Good.	3	4	Face.	...	...	...	1st.	...	...	Note <i>c</i>	"
171	2	1	...	11	Smallpox.	6	3	Face.	...	...	...	...	...	...	...	"
172	3	3	...	5	Good.	1	3	Face.	...	...	...	...	...	...	...	"

a On 2nd week of convalescence, sub-auricular lymphatic glands in right side suppurated and burst.

b Suppuration, as in above, in 2nd week of convalescence.

c Ten days after rash disappeared she became comatose, and remained so for 3 hours; very anæmic, next day lobar pneumonia of both apices; pertussis with croup.

No.	Interval in Days.	If previously had Measles.	No. of children in family.	No. attacked now.	No. attacked previously.	Age.	PREVIOUS HISTORY.	Duration in Days of		First site of Exanthem.	Tongue.	Throat.	Urine.	Vomiting when.	Convulsions when.	COMPLICATIONS.	SEQUELÆ.	RESULT.
								1st stage.	2nd stage.									
196	13	...	4	2	2	8	Scarlatina. Bronchitis.	2	4	Face. Neck.	...	...	...	...	...	...	...	Recovery.
197								14	3									
198	13	...	2	2	...	4	Bronchitis twice. Good.	?	5	Trunk. Face.	...	...	...	...	...	...	Note <i>a</i>	"
199								?	3									
200	11	...	8*	2	...	4	Good. Good.	6	3	Face. General.	...	...	...	...	...	Right lobar pneumonia.	...	"
201								6	3									
202	...	...	4	1	3	7	Good.	4	4	Face dark.	...	Note <i>b</i>	...	...	...	Glands on left side enlarged.	...	"
203								5	3									
204	11	...	3	2	1	3	Good. Good.	5	3	Face. Face.	...	...	...	...	...	...	...	"
205								5	3									
206	...	...	1	1	...	1 ⁵	Good.	4	3	...	...	...	...	...	...	...	...	"
207								8	3									
208	...	...	2	2	...	1 ³	Good. Bronchitis often.	5	3	Back. General.	...	...	...	...	...	...	...	"
209								2	3									
210	7	...	6	3	3	4 ⁶	Good.	2	10	General.	...	...	...	...	...	Pneumonia 2nd stage; great prostration; typhoid symptoms.	...	"
211								4	4									
212	...	Yes	11	8	8	1 ²	Scarlatina, dropsy, pertussis, measles.	7	3	Face.	...	...	...	...	...	...	...	"
213								2	2									
214	10	Yes	...	...	...	4	Scarlatina, measles.	5	3	Face.	...	...	...	...	...	...	...	"
215								...	...							

a Suppuration of glands behind sterno-mastoid fortnight after.

* Baby 6 weeks old has escaped.

b Urates 2nd.

No.	Interval in Days.	If previously had Measles.	No. of children in family.	No. attacked now.	No. attacked previously.	Age.	PREVIOUS HISTORY.	Duration in Days of		First site of Exanthem.	Tongue.	Throat.	Urine.	Vomiting when.	Convulsions when.	COMPLICATIONS.	SEQUELÆ.	RESULT.
								1st stage.	2nd stage.									
235	...	...	5	1	4	2 ⁶	Good.	2	5	Face and back.	...	...	...	1st.	...	...	...	Recovery.
236	...	...	3	3	0	5 ⁶	Good.	3	3	Back.*	...	Sore.	...	1st.	...	...	...	"
237	12	...	...	...	...	3	Good.	3	3	Back.	...	...	...	...	...	...	...	"
238	12	...	...	...	...	2	Good.	4	1	Back and face only.	...	...	...	...	...	Pneumonia of left lung commenced immediately on disappearance of rash.	...	"
239	...	...	...	...	...	29	...	...	...	Note <i>a</i>	...	...	...	...	...	Prostration.	...	"
240	...	...	3	3	...	8	Good.	3	5	Face pale.	Large ulcers.	Sore.	Healthy.	...	...	Severe conjunctivitis.	...	"
241	...	...	...	...	...	4	Good.	3	3	Face.	Quite dry.	...	...	...	...	Severe bronchitis, 1st stage.	...	"
242	11	...	...	...	...	0 ¹¹	Good.	4	4	...	...	...	...	...	...	...	...	"
243	...	...	2	1	1	3	Good.	4	5	Back and face.	...	...	...	...	...	...	...	"
244	...	...	4	4	...	4 ⁶	Good.	3	4	Face.	...	...	...	1st, 2nd.	...	...	...	"
245	6	...	...	...	...	6	Bronchitis, always delicate.	1	4	General.	...	...	...	1st, 2nd.	...	...	...	"
246	15	...	...	...	...	3	Good.	3	4	Face.	...	...	...	1st.	...	...	...	"
247	18 [†]	0 ¹¹	Good.	4	5	Back; never on face.	...	...	...	...	...	...	...	"
248	...	...	3	3	...	4	Very delicate on chest until 2 years old.	7	3	Back.	...	...	...	...	...	Right sub-maxillary enlarged.	...	"
249	3	...	...	...	...	7	Good.	7	3	Back.	...	...	...	...	...	Severe bronchitis.	...	"
250	4	...	...	...	...	2	Delicate.	7	3	Back.	...	...	...	...	Note <i>b</i>	Severe bronchitis.	...	"

* Noticed first because child complained of itching.

a Vomiting and rigors 3 days; no rash, but desquamation over chest a few days afterwards.*b* When rash appearing.

251	...	2	2	2-3	Bronchitis.	4	4	General.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	Recovery.
252	14	...	...	...	Good.	6	3	Back.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	,"
253	...	5*	1	3	Bronchitis; often scrofulous.	6	4	Face.	Note <i>a</i>	...	...	...	...	...	...	...	...	...	...	...	...	...	,"
254	...	4	2	5	Convulsions ow- ing to dentition.	5	3	General.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	,"
255	10	...	...	2	Good.	3	3	Face.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	,"
256	...	3	1	0-10	Severe bron- chitis 1 month ago.	4	4	Face pale.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	,"
257	...	4	4	10	Struma.	3	7	Face.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	,"
258	11	...	...	6	Pertussis.	7	3	Trunk.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	,"
259	11	...	...	3	Good.	7	3	Face.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	,"
260	11	...	...	1	Good.	7	4	Face.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	,"
261	...	4	2	4	Good.	3	3	Face.	...	...	...	...	2nd.	...	...	...	...	...	...	...	...	...	,"
262	12	...	...	3	Good.	4	4	Face.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	,"
263	...	4	3	6	Good.	3	3	Trunk.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	,"
264	6	...	...	4	Pertussis.	6	3	Trunk.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	,"
265	14	...	...	2	Good.	6	3	Face.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	,"
266	...	8	1	3	Good.	1	4	Neck.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	,"
267	...	2	1	1	Pertussis, vari- cella.	6	3	Back.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	,"
268	...	4	3	1	Good.	3	3	Back.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	,"
269	4	...	...	6	Good.	4	3	Back.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	,"
270	...	...	...	3-6	Good.	2	4	Face.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	,"
271	...	4	3	6	Bronchitis often.	4	3	Face.	...	...	...	...	1st.	...	...	...	...	...	...	...	...	...	,"
272	10	...	...	8	Small-pox.	4	3	Face and back.	...	...	...	...	1st.	...	...	...	...	...	...	...	...	...	,"
273	12	...	...	10	Small-pox.	3	3	Note <i>c</i>	...	...	...	...	...	...	...	...	...	...	...	...	...	...	,"

* Baby aged 1 year has escaped.

a Large ulcers on tips.

b When rash appearing.

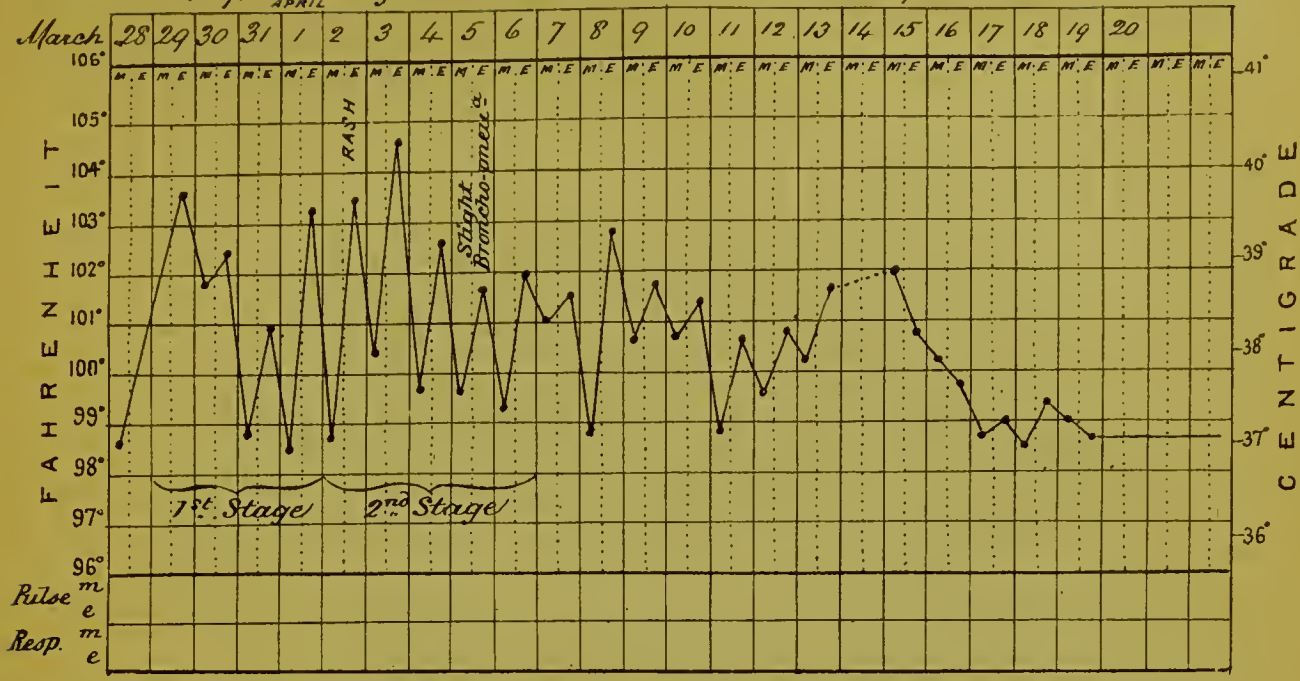
c Face; miliary vesicles well marked.

No.	Interval in Days.	If previously had Measles.	No. of children in family.	No. attacked now.	No. attacked previously.	Age.	PREVIOUS HISTORY.	Duration in Days of		First site of Exanthem.	Tongue.	Throat.	Urine.	Vomiting when.	Convulsions when.	COMPLICATIONS.	SEQUELÆ.	RESULT.
								1st stage.	2nd stage.									
274	...	...	2	2	...	4	Good.	6	2	Trunk.	...	...	...	..	...	Broncho-pneumonia before rash appeared.	Large bed sores.	Recovery.
275	2	...	...	...	...	5	Good.	4	3	Face.	...	...	...	...	...	Broncho-pneumonia.	...	"
276	...	Yes	5	4	3	5	Pertussis, and measles, and bronchitis.	4	4	Face.	...	...	...	...	...	...	...	"
277 }	7	...	...	...	...	9-12	Good.	?	3	Face.	...	...	...	...	...	...	...	"
278 }	7	Yes	...	...	...	7	Scarlatina and measles.	2	2	Back.	...	...	...	...	...	...	...	"
279	14	...	...	...	...	2-6	Good.	7	6	Face.	...	...	...	...	...	Broncho-pneumonia.	...	"
280	...	...	3	1	2	4	Pertussis; bronchitis often; phthisis and cancer in family, of father and mother	6	3	Face.	...	...	...	...	...	Bronchitis.	Phthisis.	Died.
281	...	...	1	1	...	1-11	Bronchitis.	4	8	Face.	...	...	...	...	...	Hæmorrhage under skin of face and neck.	...	Recovery.
282	...	...	7	1	6	4	Good.	6	3	Back.	...	...	...	...	...	...	...	"
283	...	...	2	1	...	0-8	Good.	4	3	Face	...	...	...	...	...	...	...	"
284	...	...	4	3	...	6	Good.	4	5	Face.	...	...	...	...	...	Subauricular glands enlarged.	...	"
285	...	...	...	...	...	3	Good.	6	6	Face and back.	...	...	...	...	...	...	...	"
286	11	...	...	...	...	2	Good.	?	3	Back.	...	...	...	...	...	...	...	"
287	...	...	3	2	1	8	Good.	4	4	Face.	...	...	...	...	...	...	...	"
288	11	...	...	...	...	4	Good.	4	5	Face.	...	...	...	...	...	...	...	"
289	3	3	...	6	Scarlatina.	4	4	Face.	...	Sore.	Pleuritis began 3rd day of rash, near base of right lung; 2 days afterwards, pneumonia of whole of right lung. Crisis on 9th day.	Profound anæmia.	"

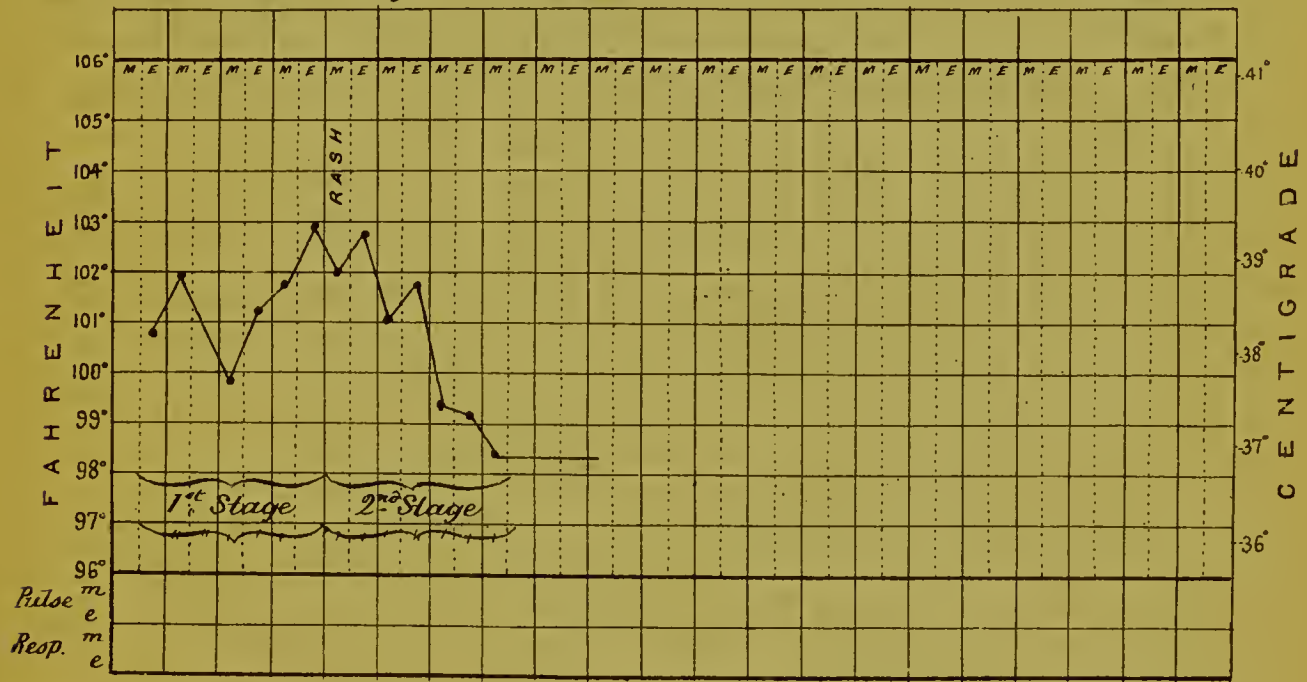
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Name *N^o 291* APRIL Age *2* Disease *Measles, & Broncho-pneumonia* Result. *Cure*



Name *Not in list* Age Disease Result



Name *Not in list* Age Disease Result

